

# GEMS Newsletter



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Spring 2005

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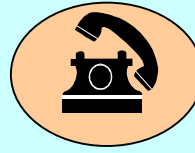
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### Articles:

- ◆ **Proposed Code Changes to Affect Environmental Monitoring** The waste program will soon submit a number of proposed code changes to the Natural Resources Board for final approval.
- ◆ **New List of Semivolatile Organic Compounds (SVOCs)** The waste program is proposing to formalize in code a list of SVOCs for facilities to use when contracting with labs. SVOCs (or BNAs) are often required as part of a landfill's monitoring protocol.
- ◆ **Pesticides at Landfills - Study Update** DNR staff have recently completed an EPA- funded pesticide study. The study targets common Wisconsin pesticides, and EDB/DBCP.
- ◆ **How to Modify the Assessment Monitoring List of Required Substances** If your facility is required to conduct assessment monitoring, you may be able to reduce the number of substances required to be analyzed.

## WHO DO I CONTACT?



### General Questions:

#### *Data Upload:*

Mike Solomon (608) 266-0867 (until 6/30/05)

[Michael.Solomon@dnr.state.wi.us](mailto:Michael.Solomon@dnr.state.wi.us)

#### *Data Formatting:*

Position Empty at Present

#### *Newsletter/ Data Quality/ Lab Methods:*

Janet Battista (608) 275-3292

[Janet.Battista@dnr.state.wi.us](mailto:Janet.Battista@dnr.state.wi.us)

#### *NR 140 Groundwater Standards:*

Barb Hennings (608) 264-6021

[Barbara.Hennings@dnr.state.wi.us](mailto:Barbara.Hennings@dnr.state.wi.us)

#### *Backup Contact for GEMS/ Environmental Monitoring:*

Jack Connelly (608) 267-7574

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### Regional Program Assistants:

#### *GEMS information, facility staff assignments:*

##### *Northeast Region:*

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##### *Northern Region:*

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##### *Southeast Region:*

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##### *West Central Region:*

Sue Brumberg (715) 839-3734

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### Other Programs:

#### *Laboratory methods and data quality:*

Lab certification (608) 267-7633

[labcert@dnr.state.wi.us](mailto:labcert@dnr.state.wi.us)

#### *Wisconsin Unique Well Numbers for private wells:*

Judy Gifford (608) 266-0153

[Judy.Gifford@dnr.state.wi.us](mailto:Judy.Gifford@dnr.state.wi.us)

#### *Wisconsin Unique Well Numbers for monitoring wells:*

Dave Johnson (608) 261-6421

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### *Official Address for Sending Data Submittals*



For United States Postal Service mail to:

GEMS Data Submittal Contact – WA/3  
Bureau of Waste Management  
Wisconsin Department of Natural Resources  
P.O. Box 7921  
Madison, WI 53707-7921

For FedEx, UPS, hand deliveries, etc. send to:

GEMS Data Submittal Contact – WA/3  
Bureau of Waste Management  
Wisconsin Department of Natural Resources  
101 South Webster Street  
Madison, WI 53702

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### **Electronic Data Submittals Affected by Budget Cuts**

The Waste Management program has experienced significant budget cuts in recent years, which have likely been felt directly by those submitting environmental monitoring results. Lindsey Miller, our program assistant, attempts to upload all electronic data submitted to our program. Any data that do not upload successfully are passed on to the GEMS Technician. The GEMS Technician evaluates what the problem is and works with the consultants, labs and facilities to make sure the data are uploaded successfully.

The budget cuts have resulted in lay-offs and reassignment of staff to new positions. As a result, four different people have worked in the GEMS Technician position since August 2003. Because of the frequent turnover of staff, a significant backlog of unsuccessfully loaded submittals has accumulated. We apologize for the confusion or delays this may have caused. For the last round of budget cuts, the Waste Management Program reduced the GEMS Technician work activities from the equivalent of a 1.25 permanent position to a 0.25 permanent position. Wayne Ringquist left this ¼ time position in September 2004 to take another job. Due to continuing budget issues, it was decided to hold the permanent position vacant and hire a half-time LTE as a temporary measure. Mike Solomon was hired in October 2004 as the LTE. Mike is working on addressing and eliminating all the backlogged electronic data submittal problems and processing new submittals. Mike has already made significant progress on the backlog and hopes to have it cleaned up by the end of June. Please contact Mike at [michael.solomon@dnr.state.wi.us](mailto:michael.solomon@dnr.state.wi.us) or (608) 266-0867 if you're still experiencing problems related to electronic data submittals, and contact Jack Connelly at [johnston.connelly@dnr.state.wi.us](mailto:johnston.connelly@dnr.state.wi.us) or (608) 267-7574 if you have any comments about the GEMS Technician position as a whole.

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## Update on GEMS-on-the-Web



At this time last year, we had hoped to have the GEMS database available to external users by the end of 2004. Unfortunately, budget and time constraints have trumped our desire to do this work. At this point, we have designed a process to extract GEMS data from the Oracle database, and we have designed the necessary Web pages to allow users to download the data. The next step is to work with the GEMS programmer to put the pages on the Department's intranet for testing. We are hoping to complete the testing and make GEMS data available to the general public for electronic downloads by July 1, 2005.

When we have completed this process, GEMS users both inside and outside DNR will be able to access the huge amount of environmental monitoring data the Waste Management program maintains. Our next project will be to design a web upload process so that facilities, consultants, and laboratories will be able to validate data and upload their monitoring data submittals directly.

Contact Barb Hennings at [barbara.hennings@dnr.state.wi.us](mailto:barbara.hennings@dnr.state.wi.us) or (608) 264-6021 if you have any questions about GEMS-on-the-Web.

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## GEMS Data Submittal Reminders

from Mike Solomon



Avoid putting data for two or more licenses on the same file. If there is a problem with one of the licenses, it will delay upload of the other license as well. You may submit files for more than one license on a diskette or CD.

Prepare a separate hard copy submittal (certification form, exceedance report, and cover letter) for each license. Although a cover letter is not required, it is where we look for a preliminary analysis into the cause and significance of any reported groundwater standard exceedances. Because the cover letter is retained in our files, it is also a good means to record unusual circumstances during the sampling event.

To the extent possible, label diskettes or CDs to include the site name(s), site license number(s), report period date(s), file name(s), disk or CD creator, and date sent. If the information does not fit on the diskette label or CD, include a separate sheet of paper listing the site names, license numbers, report periods, and file names.

Format data files using the following convention (all small case): first three letters representing the month of the reporting period, followed by two digit year, followed by hyphen followed by lic#, followed by file extension (.txt or .csv) as: jun05-1487.txt. If the report period includes a range of months or a group of noncontiguous months use the latest month in the file name. For example, report period January through March 2004 would be written as mar04-1487.txt, or report period June and August 2004 would be written as aug04-1487.txt.

Use the latest Certification Form. The form can be found at:  
<http://dnr.wi.gov/org/aw/wm/monitor/Downloads/EM-Cert-Form.pdf>

Send routine submittals to the [official address](#). Routine submissions are sent by mail on diskette or CD, and include a certification form, summary/exceedance report and a cover letter. DO NOT send hard copy printouts or original laboratory sheets of the data along with the electronic data submittals.

Do not open the file in Excel after creating a .csv file. Opening a .csv file in Excel may corrupt the file causing the leading zeros to be lost. Laboratories should clearly instruct consultants or other parties that review or add to their disks or CDs not to open the files in Excel. NotePad or WordPad may be used to review the files before they are submitted to the Department.

Refer to the Landfill Environmental Monitoring Downloads section on the DNR Website for the latest information on parameter code updates or any other information about groundwater monitoring data submission. This information can be found at:  
<http://dnr.wi.gov/org/aw/wm/monitor/downloads/>

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## Maintaining Monitoring Devices

by Joe Lourigan, and others



Often maintaining monitoring devices such as groundwater monitoring wells and gas probes becomes a low priority and is delayed or forgotten. But as with all things, time, weather and other environmental conditions usually take their toll on these devices. Upkeep and repairs need to be done. Sometimes casings break and the well becomes unusable, or locks become rusty or the outer protective pipes heave and become too wobbly or even come out. If left for too long in poor condition, what would have been an easy repair or maintenance job can become a major problem.

An unlocked well becomes an invitation for vandals, especially if it is easily accessible. Contaminants dumped down an unlocked well ruin the groundwater in that location and makes it more difficult or impossible to continue monitoring for potential landfill leaks. A broken well casing can act as a conduit to spread groundwater contamination.

If the monitoring wells lack integrity, the analytical results submitted to the Department may not be representative of true groundwater or landfill gas conditions. Facilities spend thousands of dollars sampling wells and having the samples analyzed, and waste management program staff spend many hours reviewing the sampling results. Most of the samples are analyzed under sensitive laboratory conditions, often yielding very low-level results, which makes the quality of the samples especially important.

Sections NR 507.04 (3), (4), (5) and (6) and NR 507.13, Wis. Adm. Code, contain several requirements facilities are supposed to follow to help prevent problems from occurring as a result of damaged or unprotected monitoring devices. We encourage facilities to take a look at these code requirements and refresh themselves from time to time. The cost and headache from cleaning up

contamination from a damaged or vandalized well is easily preventable and relatively inexpensive to do.

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## **Units Change for Reporting Results for Nitrogen in Gas**

The units required for reporting volumes of nitrogen in gas have been changed from uL/L (microliters per liter, or the equivalent parts per billion by volume) to cL/L (centiliters per liter, or parts per hundred by volume). Reporting in cL/L should eliminate the necessity of having to convert to the more common percent by volume. [For example, the concentration of nitrogen in air is 78%.] To report results for volume of nitrogen found in landfill gas, use parameter code number 99181.

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## **Use "Dissolved" Parameter Codes for Low-Flow Results**

Many facilities now use low-flow pumping as part of their routine groundwater sampling procedures. In addition, NR 508.05 requires the use of low-flow pumping whenever metals are sampled for assessment monitoring. When reporting results from samples collected using low-flow pumping use the GEMS parameter codes for "dissolved" substances, even though the samples are not filtered. The GEMS database does not currently have a way to distinguish between field-filtered samples from those collected using low-flow techniques.

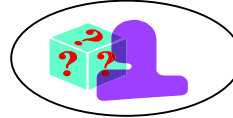
The low-flow technique eliminates the need for either field or laboratory filtering of inorganic samples by maintaining low turbulence during sample extraction and by making sure that the sample has low residual turbidity and a stabilized conductivity reading. The method ensures that samples will contain all the substances dissolved in groundwater as well as colloidal sized particles, therefore samples collected using low-flow pumping techniques may be more representative of groundwater quality than filtered samples.

Until such time as GEMS is enhanced to accurately identify the method of sample collection, please continue to use the parameter codes for "dissolved" substances when using low-flow pumping, rather than the codes for "total" substances. You will find the complete list of GEMS parameters available for download at <http://dnr.wi.gov/org/aw/wm/monitor/Downloads> .

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## Why GEMS Parameter Code Numbers Occasionally Change



The Waste Management Program occasionally changes some of the GEMS parameter code numbers - but for good reason! Most often, we have had to change a GEMS parameter code number to conform to the Department-wide parameter code list and the Federal legacy STORET list of codes. Sometimes a parameter description has changed, necessitating a new code for a new situation. This happened recently when parameter codes for elevation were augmented and changed. Sometimes historical usage has resulted in multiple parameter numbers for the same substance in GEMS, and one of the numbers must be eliminated - as happened recently with the code numbers for Benzene.

We recognize the difficulty these changes create for labs/facilities/consultants. Ultimately however, consistency throughout the Department will eliminate the confusion caused by the reporting of different parameter codes for the same substance to different Department programs. When codes do change, we switch the GEMS data reported using an older number to the new code, and create a program for automatically changing the code number in data submittals for a period of time.

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## New Parameter Codes for Diallate

Environmental laboratories can now report results to GEMS for the cis and trans isomers of Diallate. Cis-diallate (CAS #17708-57-5) has been assigned the GEMS parameter number 99753 and trans-diallate (CAS #17708-58-6), GEMS parameter number 99754. Labs that generate combined results for Diallate (CAS #2303-16-4) can continue to use GEMS parameter number 73540.

Diallate, a semivolatile organic compound (SVOC) is not differentiated into cis and trans isomers on the new NR 507 Appendix 4 list of SVOCs or on the Appendix 2 list of substances required for Subtitle D assessment monitoring.

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## Environmental Monitoring Code Changes

The solid waste program has worked with a group of externals and staff to develop NR 500 series code changes designed to clarify and streamline the plan review process. A small number of the proposed changes would affect environmental monitoring. Here is a partial list of these proposed changes:

- Remove the specific analytical methods from the NR 507 tables. Instead, a more general statement requiring the use of methods listed in EPA document SW 846, or an approved alternative method, will be



included within the body of the codes. However, if a method is specified in a Plan Approval you must continue to use the specified method.

- Remove the requirement to sample for COD at Municipal Solid Waste (MSW) and MSW combustor residue landfills.
- Add a table of semivolatile organic compounds (SVOCs). The list of SVOCs will become the new Appendix IV of NR 507, replacing the existing list of metals and inorganic parameters. [See article: [New List of Semivolatile Organic Compounds \(SVOCs\)](#)]
- Add more specific language referring to alternative geotechnical investigation programs. The Department will respond to and address alternative geotechnical proposals earlier in the siting process, but can only grant formal approval as part of the feasibility document approval. There will now be a fee for Department review of alternative geotechnical investigations.
- Add a requirement to monitor leachate head wells.
- Add code language that clarifies the requirement for reporting limits of detection (LODs) and limits of quantitation (LOQ). LODs and LOQs are only required for groundwater results for those substances having health based groundwater standards (Table 1 of NR 140). Therefore, results for indicator parameters, substances that do not occur in NR 140 Table 1, and leachate, lysimeter and other non-groundwater sample results need not be reported with LODs and LOQs.
- Allow facilities to request an alternative monitoring schedule at small demolition landfills.
- Change the baseline monitoring requirements for small demolition landfills to parallel those for MSW landfills.

In February 2005 the solid waste program obtained approval from the Natural Resources Board to take the proposed rule changes to public hearings in April 2005. The hearings will be held at 10 am on April 12 in Stevens Point (location to be determined) and April 14 in Madison (room 511 GEF 2). A public notice will be sent out announcing the exact locations. Comments from the hearings will be addressed during the spring and summer and then the solid waste program will approach the Natural Resources Board for final approval at the end of the summer. If approval were obtained, the rules would likely go into effect by the end of 2005. If you don't see the public notice of the hearings and would like to attend, please contact Jack Connelly at [johnston.connelly@dnr.state.wi.us](mailto:johnston.connelly@dnr.state.wi.us) or (608) 267-7574.

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## New Semivolatile Organic Compound List



After numerous requests for a standardized list of semivolatile organic compounds (SVOCs) for the Waste Program, we have finally created one. The list will become the new Appendix IV of Chapter NR 507, that will be official with Natural Resources Board approval of the upcoming NR 500 code changes (see article on code changes). The [SVOC list](#) includes all the individual compounds that are required to be analyzed when a "semivolatile scan," "SVOC scan" or "acid extractable/base neutral extractable" are required to be analyzed to meet a facility's general monitoring requirements



or plan of operations approval. All substances on the SVOC list can be analyzed using EPA SW 846 Method 8270.

Most commonly, a landfill is required to monitor SVOCs as part of routine leachate detection monitoring. In some instances, a facility may also analyze SVOCs in gas condensate, groundwater, lysimeter fluid or surface water. A "semivolatile organic compound scan" will replace the requirement for "acid extractable" and "base neutral extractable" compounds listed in Table 4 (Detection Monitoring of Appendix 1 in NR 507. It also replaces old lists used for reporting acid and base neutral extractable compounds as part of "priority pollutants" required for landfill monitoring. For information about how we decided which SVOCs to include in the list, see the last paragraphs of this article.

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*What the new SVOC list means to you:*

Facility owners or operators - If your facility is required to monitor leachate or other media for SVOCs or acid/base neutral extractables, be sure to add the new SVOC list [or a reference to NR 507 Appendix IV] to contracts with your consultants and/or laboratories.

Environmental laboratory chemists or managers - Six environmental laboratories with Wisconsin certification to analyze SVOCs, submitted comments on draft versions of the proposed SVOC list. Thank you to all the lab chemists and staff that commented! Your feedback helped, we hope, to make the list user-friendly for labs, without sacrificing environmental protection. Note that you may need to alter your data reporting systems in order to be able to report all the new compounds to the GEMS database. A master list of current GEMS parameter numbers, including all the individual SVOCs, can be found in the "downloads" section of our website: <http://www.dnr.wi.gov/org/aw/wm/monitor>.

Consultants - You may want to inform your facilities and environmental laboratories about the new list of SVOCs, and help coordinate data reporting for submitting the new data. A master list of all current GEMS parameter numbers, including all the individual SVOCs on the new list, can be found in the "downloads" section of our website: <http://www.dnr.wi.gov/org/aw/wm/monitor>.

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*How we created the SVOC list:*

To create the SVOC list we first compared several existing regulatory lists including the NR 215 Wastewater priority pollutants, Subtitle D Appendix II non-pesticide SVOCs, SVOCs having NR 140 Groundwater Standards, and a list of SVOCs under Safe Drinking Water Act (SDWA) regulation. We then searched our GEMS database to determine the frequency of occurrence of each of the SVOCs that had been analyzed in landfill samples. We discarded numerous SVOCs that occur on the Subtitle D Appendix II list that were never detected during a substantial number of landfill sample analyses. This became the draft list of SVOCs that was reviewed by chemists at DNR and at environmental laboratories.

Environmental laboratory and/or DNR chemists pointed out potential analytical problems with several SVOCs on our draft list including: Carbazole; 1,2-Diphenylhydrazine; N-nitrosodiphenylamine; Benzidine; Benzoic Acid, and p-Chloroaniline. These substances were removed from the list because of concerns and questions about the meaning of the results. Some of these were known to break down during the analytical process. EPA identified others as having

severe analytical limitations. Diphenylamine, a breakdown product of N-nitrosodiphenylamine, was added as a replacement for N-nitrosodiphenylamine.

We kept all the non-pesticide SVOCs that have Wisconsin Groundwater Standards on the list and all the SVOCs regulated under the SDWA.

Contact Janet Battista of the South Central Region Waste Management program staff at (608) 275-3292, if you have any questions about the SVOC list.

[SVOC list](#)

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### Semivolatile Organic Compound (SVOC) Analyte<sup>1</sup> List

Analyte <sup>2</sup>	CAS <sup>3</sup> Number	Systematic Name <sup>4</sup> /Common Name
Acenaphthene	83-32-9	Acenaphthylene, 1,2-dihydro-
Acenaphthylene	208-96-8	Acenaphthylene
Acetophenone	98-86-2	Ethanone, 1-phenyl-
Anthracene	120-12-7	Anthracene
Benz(a)anthracene	56-55-3	Benz[a]anthracene Benzanthracene
Benzo(b) fluoroanthene	205-99-2	Benz[e]acephenanthrylene
Benzo(k)fluoroanthene	207-08-9	Benzo[k]fluoranthene
Benzo(g,h,i)perylene	191-24-2	Benzo[ghi]perylene
Benzo(a)pyrene	50-32-8	Benzo[a]pyrene
Benzyl alcohol	100-51-6	Benzenemethanol
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1'-[methylenebis (oxy)]bis[2-chloro-
Bis(2-chloroethyl)ether	111-44-4	Ethane, 1,1'-oxybis[2-chloro- Dichloroethyl ether
Bis(2-chloro-1-methylethyl)ether	108-60-1	Propane, 2,2'-oxybis[1-chloro- Bis(2-chloroisopropyl)ether

Bis(2-ethylhexyl)phthalate	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
4-Bromophenyl phenyl ether	101-55-3	Benzene, 1-bromo-4-phenoxy-
Butyl benzyl phthalate	85-68-7	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester
p-Chloro-m-cresol	59-50-7	Phenol, 4-chloro-3-methyl- 4-Chloro-3-methylphenol
2-Chloronaphthalene	91-58-7	Naphthalene, 2-chloro-
2-Chlorophenol	95-57-8	Phenol, 2-chloro-
p-Chlorophenyl phenyl ether	7005-72-3	Benzene, 1-chloro-4-phenoxy- 4-Chlorophenyl phenyl ether
Chrysene	218-01-9	Chrysene
m-Cresol	108-39-4	Phenol, 3-methyl- 3-Methylphenol
o-Cresol	95-48-7	Phenol, 2-methyl- 2-Methylphenol
p-Cresol	106-44-5	Phenol, 4-methyl- 4-Methylphenol
Dibenz(a,h)anthracene	53-70-3	Dibenz[a,h]anthracene
Dibenzofuran	132-64-9	Dibenzofuran
Di-n-butyl phthalate	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
m-Dichlorobenzene	541-73-1	Benzene, 1,3-dichloro- 1,3-Dichlorobenzene
o-Dichlorobenzene	95-50-1	Benzene, 1,2-dichloro- 1,2-Dichlorobenzene
p-Dichlorobenzene	106-46-7	Benzene, 1,4-dichloro- 1,4-Dichlorobenzene
3,3'-Dichlorobenzidine	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-

2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
2,4-Dimethylphenol	105-67-9	Phenol, 2,4-dimethyl- m-Xylenol
Dimethyl phthalate	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
4,6-Dinitro-o-cresol	534-52-1	1,2-Benzenedicarboxylic acid, dimethyl ester 4,6-Dinitro-2-methylphenol
2,4-Dinitrophenol	51-28-5	Phenol, 2,4-dinitro-
2,4,-Dinitrotoluene	121-14-2	Benzene, 1-methyl-2,4-dinitro-
2,6-Dinitrotoluene	606-20-2	Benzene, 2-methyl-1,3-dinitro-
Di-n-octyl phthalate	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester
Diphenylamine	122-39-4	Benzeneamine, N-phenyl-
Fluoroanthene	206-44-0	Fluoranthene
Fluorene	86-73-7	9H-Fluorene
Hexachlorobenzene	118-74-1	Benzene, hexachloro-
Hexachlorobutadiene	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
Hexachlorocyclopentadiene	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
Hexachloroethane	67-72-1	Ethane, hexachloro-
Indeno(1,2,3-cd)pyrene	193-39-5	Indeno[1,2,3-cd]pyrene
Isophorone	78-59-1	2-Cyclohexen-1-one, 3,5,5-trimethyl-
1-Methylnaphthalene	90-12-0	Naphthalene, 1-methyl-
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-

Naphthalene	91-20-3	Naphthalene
m-Nitroaniline	99-09-2	Benzenamine, 3-nitro- 3-Nitroaniline
o-Nitroaniline	88-74-4	Benzenamine, 2-nitro- 2-Nitroaniline
p-Nitroaniline	100-01-6	Benzenamine, 4-nitro- 4-Nitroaniline
Nitrobenzene	98-95-3	Benzene, nitro-
o-Nitrophenol	88-75-5	Phenol, 2-nitro- 2-Nitrophenol
p-Nitrophenol	100-02-7	Phenol, 4-nitro- 4-Nitrophenol
N-Nitrosodimethylamine	62-75-9	Methanamine, N-methyl-N-nitroso-
N-Nitrosodipropylamine	621-64-7	1-Propanamine, N-nitroso-N-propyl- N-Nitroso-N-dipropylamine
Pentachlorophenol	87-86-5	Phenol, pentachloro-
Phenanthrene	85-01-8	Phenanthrene
Phenol	108-95-2	Phenol
Pyrene	129-00-0	Pyrene
Pyridine	110-86-1	Pyridine
2,3,4,6-Tetrachlorophenol	58-90-2	Phenol, 2,3,4,6-tetrachloro-
1,2,4-Trichlorobenzene	120-82-1	Benzene, 1,2,4-trichloro-
2,4,5-Trichlorophenol	95-95-4	Phenol, 2,4,5-trichloro-
2,4,6-Trichlorophenol	88-06-2	Phenol, 2,4,6-trichloro-

1 DNR GEMS parameter numbers for the substances in this table can be found at <http://www.dnr.wi.gov/org/aw/wm/monitor/Downloads/>

- 2 Analyte names are EPA Registry names see: <http://epa.gov/srs>
- 3 Chemical Abstracts Service registry number.
- 4 Systematic Names are from the EPA Registry see: <http://epa.gov/srs>

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## Pesticides at Landfills – What We Learned

We have recently completed an investigation into the possible occurrence of numerous key pesticides at Wisconsin landfills. This article briefly summarizes the two separate parts of the investigation: one part evaluating the occurrence of eleven of the most commonly used Wisconsin pesticides, and the other part evaluating the occurrence of two lesser known pesticides, DBCP and EDB, at landfills. The Fall, 2003 issue of the GEMS newsletter describes the purpose and methods of the study in detail, and the final report will be available on our website soon.

### Pesticides in the Study

Alachlor  
Aldicarb  
Atrazine  
Carbofuran  
Chloropyrifos  
Cyanazine  
Diazinon  
Metolachlor  
Metribuzin  
Simazine  
2,4-D

*Common pesticides:* In the first part of the study, the authors investigated whether eleven of the most commonly used Wisconsin agricultural and household/commercial-use pesticides were found at Wisconsin landfills. These substances (see box) are not part of routine monitoring at landfill sites, despite their widespread use in Wisconsin.

For the investigation, the authors selected eleven closed Wisconsin landfills that are known to be releasing other types of contaminants, such as VOCs, to groundwater. They selected three downgradient monitoring wells and one background monitoring well at each site for sampling. Four of the eleven landfills had leachate tanks, and the authors collected leachate samples at these locations as well. This part of the study used immunoassay techniques for analysis of the groundwater and leachate samples. As a check, five of the groundwater samples showing positive results for pesticides under immunoassay analysis were also analyzed by chromatographic methods.

*Study findings for common pesticides:* The authors found preliminary evidence that leaking landfills may be contributing alachlor, aldicarb, atrazine and 2,4-D to groundwater. The common household pesticide 2,4-D occurred at the highest concentration of all the pesticides tested and was found in groundwater at five of the eleven landfills. Carbofuran, metolachlor, and simazine may also be leaking from landfills but the study suggests that this may be occurring to a lesser extent. All four of the leachate samples contained pesticides: atrazine, alachlor metabolites, aldicarb and 2,4-D occurred most frequently and in the highest concentrations in leachate.

The study results suggest that pesticides that are a part of background groundwater conditions can be distinguished from pesticides originating from a leaking landfill – background levels were markedly lower than downgradient groundwater levels in most cases. Immunoassays proved to be an effective, cost effective technique to identify landfills and wells where pesticides, or their metabolites, may be leaching into groundwater. Since immunoassay results may not be directly

comparable with traditional analytical methods, confirmation samples may be necessary for regulatory purposes.

Time decay curves run for the pesticides suggest that holding times, especially for 2,4-D, may need to be shortened. For example, concentrations of 2,4-D decay to only 10% of the original amounts after 14 days. This suggests that the levels of 2,4-D found in the study samples may be far less than true groundwater concentrations.

*Uncommon “required” pesticides:* A second, independent part of the study focused on two additional pesticides: DBCP and EDB. The extent of use of DBCP and EDB in Wisconsin is not known. They are, however, included in the list of VOCs required for monitoring at most landfills; laboratories using EPA SW 846 Methods 8260 or 8021 for analysis of VOCs will include DBCP and EDB in their reported results.

Unfortunately, when analyzed by EPA Method 8260 or 8021, the detection limits for DBCP and EDB are higher than the regulatory standards, so for this study, they were analyzed by the more sensitive SDWA Method 504.1.

*Study findings for DBCP and EDB:* Neither DBCP nor EDB were detected in any of the samples collected at any of the eleven landfills, despite their analysis using the more sensitive analytical method. These findings suggest that a separate method may not be necessary for routine environmental monitoring at landfills.

*Recommendations:* The study researchers had intended to extend this study to another year but funding and staff changes have made a second year impossible. They recommend additional studies including side-by-side analyses using immunoassay and traditional methods, more investigation into the effect of holding time on sample results, and development of groundwater standards for metabolites of alachlor.

Considering the frequency of occurrence of 2,4-D at the study landfills, and the amounts remaining after at least 14 days, further investigation into the prevalence of 2,4-D at landfills would appear most important.

Donalea Dinsmore, currently in the Department's Air Management program, is the principal author of this study. If you have any questions about this article, please contact Janet Battista at [janet.battista@dnr.state.wi.us](mailto:janet.battista@dnr.state.wi.us) or (608) 275-3292.

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## How to Modify the Assessment Monitoring List

Facilities sometimes request modifications to the list of monitoring parameters required for assessment monitoring at Subtitle D landfills. The Environmental Monitoring Team has secured approval from EPA for site-by-site modifications to the assessment-monitoring list if good justification can be made. As a general policy, if a subtitle D landfill has been monitoring for the entire list of assessment monitoring parameters for 2 or more years, the owner may request to eliminate parameters that have not been detected from the rest of the assessment monitoring period.



The facility should contact the DNR hydrogeologist assigned to the site, who would then need to consult with others in the program in order to maintain statewide consistency.

The facility should submit a written request for an exemption under 500.08(4) and provide justification for eliminating specific parameters from the Appendix 2 list. If the request were approved, the facility would receive a letter allowing the reduction in parameters. The letter should be kept with the other approvals for the facility. At this time, there is no fee for such a request. Please note that for additional reductions in the future, the facility would have to submit another exemption request. Please contact Barb Hennings at [barbara.hennings@dnr.state.wi.us](mailto:barbara.hennings@dnr.state.wi.us) or (608) 264-6021 if you have any questions about this article. ★★

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